ABSTRACT

A dynamic range relaxation algorithm is applied to simulate borehole failure under a variety of stress conditions. The borehole and its neighborhood are modeled by a number of regions by a plurality of interconnected nodes. The bonds between the nodes may be modeled as springs, rods, or beams. The strength of the bonds has a statistical variation to accurately simulate real world situations. The model may include, in addition to the borehole and the far earth formations, a liner, a casing, and/or a gravel pack. Simulation is carried out for different strength of the bonds.